

DATA GAPS MEMORANDUM - SAUGET AREA 1 AND 2 SITES

Ecology and Environment, Inc., (E & E) has prepared this document pursuant to Work Assignment Number 47-5N6O, issued under the United States Environmental Protection Agency (EPA) Region 5 Alternative Remedial Contracting Strategy (ARCS) Contract Number 68-W8-0086. The purpose of this document is to briefly identify any significant data gaps for the Sauget area sites which might prohibit the completion of a comprehensive Remedial Investigation (RI) report, including a Human Health Risk Assessment (HHRA). The information provided in this technical memorandum was developed based upon a review of the available file information for the Sauget Area 1 and 2 Sites from both state and federal agencies. The available data from these agencies was compiled and presented to EPA in a document titled: *Sauget Area 1 and 2 Sites - Area 1 Data Tables/Maps (Volume 1)* and *Sauget Area 1 and 2 Sites - Area 2 Data Tables/Maps (Volume 2)*. This report also presents a narrative for each site in Area 1 and 2 which briefly discusses the nature and extent of contamination, site containment, a listing of all environmental samples collected, and a description of the site features and history. The evaluation of data gaps for soils and sediments in this memorandum is described separately for each site or creek segment. The evaluation of groundwater data gaps addresses the sites collectively for Area 1 and, separately for Area 2.

AREA 1 SITES

Site G

The nature and extent of soil contamination at Site G is well defined both laterally and vertically. An EPA removal action conducted in 1995 included the importing, placement, and grading of approximately 30,000 tons of clean soil over the site. It is not known from the available file information if the entire site or just a portion was covered with the clean fill. Prior to placement of this clean fill, 49 surface soil sample had been collected on Site G and three were collected immediately off site to the south. A total of 43 of these samples were analyzed for full Target Compound List (TCL) and Target Analyte List (TAL) parameters. The surface soils were collected from a grid system, ensuring adequate coverage of the site. A total of 24 subsurface soil samples were collected from 12 borings on Site G. Samples from these borings were collected to a maximum depth of 40 feet BGS. The borings are

placed to provide good lateral coverage and the sample intervals provide good vertical distribution information. Based upon the number and distribution of soil samples collected during previous investigations at Site G, it is believed that soil contamination at the site has been adequately characterized, and no significant data gaps exist for Site G soils. One potential data gap is that there have not been any documented samples collected after the fires at the site which were analyzed for dioxins and furans. These contaminants may be by-products of chemicals burned in the fire. In addition, the analyses performed for the samples collected from the site do not include analyses for disposal parameters, nor do they include analyses to evaluate potential treatment alternatives.

Site H

The nature and extent of contamination is moderately well defined at Site H. No surface soil samples have been collected at this site. A total of 11 subsurface soil samples were collected from 9 borings on Site H. All of these samples were analyzed for full TCL and TAL parameters. Samples from these borings were collected to a maximum depth of 25 feet BGS. The borings are placed to provide fairly good lateral coverage, and the sample depth intervals provide good vertical distribution information. The obvious data gap that exists involves the lack of any surface soil samples at Site H. Analysis of surface soils would be necessary to complete a baseline HHRA, and although the contamination may be covered with fill material at the site, the fill material has not been characterized. In addition, analyses performed for the samples collected from Site H do not include analyses for disposal parameters, nor do they include and analyses to evaluate potential remediation options and technologies.

Site I

The nature and extent of contamination is moderately well defined at Site H. No surface soil samples have been collected on Site I. A total of 15 subsurface soil samples were collected from 12 borings on Site I. All of these samples were analyzed for full TCL and TAL parameters. Samples from these borings were collected to a maximum depth of 39 feet BGS. The borings are placed to provide fairly good lateral coverage, and the sample depth intervals provide good vertical distribution information. The obvious data gap that exists involves the lack of any surface soil samples at Site I. Analysis of surface soils would be necessary to complete a baseline HHRA. The fill materials on the site are covered with gravel, however, and therefore surface soils may not be a concern under some exposure

pathways. Additional boring and subsurface soil samples may also be warranted, given the size of the disposal area, the limited number of borings previously conducted, and the desired confidence level for the RI objectives. In addition, the analyses performed for the samples collected from Site I do not include analyses for disposal parameters, nor do they include any analyses to evaluate potential remediation options.

Site L

The nature and extent of contamination is well defined for the main impoundment at Site L. Only two surface soil samples have been collected at Site L, and these samples were collected away from the main impoundment. A total of 11 subsurface soil samples were collected from 21 borings on Site L. All of these samples were analyzed for volatile, semivolatile, pesticide, PCB, and metals suites. Two samples were characterized for reactivity, corrosivity, ignitability, and TCLP volatiles, TCLP semivolatiles, TCLP pesticides, TCLP herbicides, and TCLP metals. Samples from these borings were collected to a maximum depth of 20 feet BGS, and the majority of the contaminants detected are from the samples collected between 5 to 15 feet BGS. The borings are placed to provide very good lateral coverage of the main impoundment and the sample depth intervals provide good vertical distribution information. The only obvious data gap that exists involves the lack of any surface soil samples at Site L. Analysis of surface soils may be necessary to complete a baseline HHRA. File information indicates a second potential impoundment to the west of the main impoundment at Site L. This impoundment has not been found or characterized, therefore additional investigative sampling may be warranted to identify or discount this potential feature, depending upon the RI objectives.

Site M

The nature and extent of contamination is very well defined for Site M. A total of 5 surface water samples have been collected from Site M, 4 of which were analyzed for full TCL and TAL parameters. A total of 16 sediment samples have been collected from Site M. Sediment thickness has been characterized in at least 10 locations across the site. Three of the sediment samples were analyzed for full TCL and TAL parameters. One sample was analyzed for reactivity, corrosivity, ignitability, and TCLP volatiles, TCLP semivolatiles, TCLP pesticides, TCLP herbicides, and TCLP metals. The sediment sample locations were placed to provide very good lateral coverage and the sediment thickness information. No obvious data gaps exist for Site M.

Site N

The nature and extent of contamination is poorly defined at Site N. No surface soil samples have been collected at Site N. In addition, a total of 2 subsurface soil samples were collected from 2 borings on Site N. The two samples collected were analyzed for full TCL and TAL parameters. Samples from these borings were collected to a maximum depth of 15 feet BGS. The primary data gap that exists involves the lack of any surface soil samples at Site N. Analysis of surface soils may be necessary to complete a baseline HHRA. In addition, additional borings and subsurface soil samples may also be warranted, depending upon how suspect this area may be as a source of contamination. Only low levels of organics and inorganics were detected in the two samples collected. Also, although historical photographs indicate this area may have been used as a disposal area, it may consist primarily of construction debris.

Creek Segment A (CS-A)

CS-A was remediated in 1990 by the PRP under IEPA's oversight. Approximately 27,500 tons of contaminated creek sediment were removed from CS-A. This creek segment has since been filled and covered with crushed stone. It is not known if any confirmation sampling of the excavation base or sidewalls was completed at the time of removal. It is therefore assumed that only low levels of residual contamination may be present in the soils adjacent to the CS-A excavation.

Creek Segment B (CS-B)

The nature and extent of contamination is well defined for the sediments in CS-B. A total of 60 sediment samples have been collected from approximately the 0- to 1-foot depth interval in CS-B. Of the 60 samples, nine were analyzed for full TCL and TCL parameters or a near comparable suite of analyses. A total of 33 sediment samples were collected in CS-B from depths up to seven feet BGS. Twenty of these deep sediment samples were analyzed for full TCL and TCL parameters or a comparable suite of analyses. Three samples, which were composites from 0- to 6-feet BGS, were characterized for reactivity, corrosivity, ignitability, and TCLP volatiles, TCLP semivolatiles, TCLP pesticides, TCLP herbicides, and TCLP metals. The sample locations were placed to provide very good coverage of the creek segment from north to south with good vertical distribution information. One potential data gap might be a lack of subsurface information within the creek segment. Although a number of sediment samples were collected to a depth of approximately three feet or more, contami-

nation was found at these depths at some sample locations, and further sampling may be warranted based upon the level of confidence required and the RI objectives.

A total of eight surface water samples were collected from CS-B. Seven of these samples were analyzed for Full TCL and TCL parameters. This number of samples is probably sufficient for RI purposes, especially since the creek is intermittent and may contain little to no water, or only ponded areas depending on the time of the year and amount of water influx.

Creek Segment C (CS-C)

The nature and extent of contamination is fairly well defined for the sediments in CS-C. A total of four sediment samples have been collected from approximately the 0- to 1-foot depth interval in CS-C. Two of these four samples were analyzed for full TCL and TCL parameters or a comparable suite of analyses. Two sediment samples were collected in CS-C from depths of 2- to 2.5-feet BGS. These two samples were also analyzed for full TCL and TCL parameters. The sample locations were placed to provide adequate coverage of the creek segment from north to south, given that the length of this creek segment is very short. However, one data gap exists in that the deeper sediment samples were also contaminated, and therefore, the vertical extent of contamination is not well defined. Additional sample locations may also be warranted, depending on the required confidence level for characterizing the volume of contaminated sediments in this creek segment.

A total of five surface water samples were collected from CS-C. Three of these samples were analyzed for Full TCL and TCL parameters. This number of samples is probably sufficient for RI purposes, especially since the creek is intermittent and may contain little to no water, or only ponded areas, depending on the time of the year and amount of water influx.

Creek Segment D (CS-D)

The nature and extent of contamination is fairly well defined for the sediments in CS-D. A total of three sediment samples have been collected from approximately the 0- to 1-foot depth interval in CS-D. Two of these four samples were analyzed for full TCL and TCL parameters or a comparable suite of analyses. Two sediment samples were collected in CS-C from depths of 1.5- to 2-feet BGS. These two samples were also analyzed for full TCL and TCL parameters. The sample locations were placed to provide adequate coverage of the creek segment from north to south given that the length of this creek segment is very short.

However, one data gap exists in that the deeper sediment samples were also contaminated, and therefore, the vertical extent of contamination is not well defined. Additional Sample locations may also be warranted, depending on the required confidence level for characterizing the volume of contaminated sediments in this creek segment.

A total of two surface water samples were collected from CS-D. These samples were analyzed for Full TCL and TCL parameters. This number of samples is probably sufficient for RI purposes, especially since the creek is intermittent and may contain little to no water, or only ponded areas, depending on the time of the year and amount of water influx.

Creek Segment E (CS-E)

The nature and extent of contamination is fairly well defined for the sediments in CS-E. A total of seven sediment samples have been collected from CS-E. Although not specified, it is assumed that these samples consisted of surficial (0 to 6 inches) grab samples. Four of these seven samples were analyzed for full TCL and TCL parameters or a comparable suite of analyses. The sample locations were distributed across the creek segment, and provide adequate coverage of CS-E from north to south. One data gap likely exists in that deeper sediment samples were not collected, and therefore, the vertical extent of contamination is not defined for this creek segment. Additional sample locations may also be warranted, depending on the required confidence level for the RI data and objectives, although it appears that the existing number of sampling locations is probably adequate for any RI objectives.

A total of two surface water samples were collected from CS-E. This number of samples is probably sufficient for RI purposes, especially since the creek is intermittent and may contain little to no water, or only ponded areas, depending on the time of the year and amount of water influx.

Creek Segment F (CS-F)

The nature and extent of contamination is moderately well defined for the sediments in CS-F. A total of 15 sediment samples have been collected from CS-F. Although not specified, it is assumed these samples consisted only of surficial grab samples. Four of these seven samples were analyzed for full TCL and TCL parameters. The sample locations were distributed across the creek segment, and provide adequate coverage of CS-F from north to south. However, one data gap exists in that the southern portion of CS-F disperses into a wetland setting. Additional sediment samples, laterally offset from the main creek channel (if

present) may be warranted to further characterize impacted sediments in CS-F and the wetland area. Additional sample locations may not be necessary if existing contaminants detected in this creek segment are not anticipated to exceed any potential clean-up criteria established for the Sauget sites. In addition, deeper sediment samples may be required at those locations where elevated organics were detected to evaluate potential vertical contaminant distribution. This also will be determined based upon the required precision of the RI data and the associated objectives.

No surface water samples were collected from CS-F. It is therefore unknown if the surface water in this segment is impacted by the contamination detected in the sediments or from surface waters upstream.

Area 1 Groundwater

The nature and extent of shallow groundwater contamination beneath the Sauget Area 1 Sites is fairly well defined. A total of 72 groundwater samples have been collected from the 30 Area 1 monitoring wells. A total of 25 of the 72 monitoring well samples were analyzed for full TCL and TCL parameters. In addition, 14 groundwater samples were collected from 10 residential wells near the Area 1 Sites. Four of these residential well samples were analyzed for full TCL and TCL parameters. It is assumed that the residential wells, where no well completion depth or screened intervals were documented, are completed in the shallow groundwater zone (less than approximately 50 feet). The monitoring well locations in Area 1 provide good lateral coverage of shallow groundwater in the vicinity of the Area 1 sites, with a few exceptions. One data gap is that there are no monitoring wells west of CS-A on Cerro property to assess contaminant migration from CS-A or Site I, and there are no wells to the west of CS-B near Site M. Another potential data gap is that there are no wells assessing the potential impact from the remaining creek sectors, or from Site N. Subsurface soil contamination detected at Site N and contaminated sediments from segments C through F could be a continuing source of shallow groundwater contamination through infiltration.

Additional data gaps for Area 1 groundwater exist due to the lack of any groundwater data for the intermediate or deep groundwater zones (approximately 50 feet to 110 feet). Wastes were detected in borings at sites G, H, and I to depths of 36 feet BGS, which is below the water table, and approaching the intermediate groundwater zone. Therefore, contamination of the intermediate or deep groundwater zones within Area 1 may be likely. However, because vertical gradients have not been evaluated, it is difficult to assess the potential vertical migration of contaminants.

AREA 2 SITES

Site O

The nature and extent of contamination at Site O is fairly well defined both laterally and vertically. No surface soil samples have been collected at Site O. A total of 17 subsurface soil samples were collected from 12 borings and 2 pit excavations on Site O. Samples from the borings were collected to a maximum depth of 30 feet BGS. The lateral boundaries of the lagoons which make up Site O are well defined, and the soil boring sample depth intervals provide good information on the vertical distribution of contaminants. The lagoons are closed, covered, and vegetated. The quality and amount of cover is unknown. One potential data gap therefore exists for physical and chemical characterization of the site cover materials.

Site P

The nature and extent of contamination is not well defined at Site P. No surface soil samples have been collected at this site. A total of 4 subsurface soil samples were collected from 3 boring locations on Site P. All of these samples were analyzed for full TCL and TAL parameters. Samples from these borings were collected to a maximum depth of 35 feet BGS. The primary data gap that exists for this site involves the absence of any surface soil analytical data. Analysis of surface soils would be necessary to complete a baseline HHRA. In addition, although the samples collected revealed only metals/cyanide and low level VOC contamination in shallow subsurface soils, the number of boring locations and subsurface soil samples may be insufficient, depending upon the objectives of the RI. Also, the analyses performed for the samples collected from Site P do not include analyses for disposal parameters, nor do they include and analyses to evaluate potential remediation options.

Site Q

For the purposes of this memorandum, the discussion of Site Q data gaps is broken down by area; the southern portion of Site Q (south of the Alton & Southern RR tracks) and the central/northern portion of Site Q (north of the Alton & Southern RR tracks).

Southern Portion - The nature and extent of contamination is fairly well defined in the southern portion of Site Q. A total of 17 surface soil samples have been collected from the southern portion of Site Q. Eleven of these 17 samples were analyzed for full TCL and TAL parameters. No subsurface soil samples were collected from the southern portion of Site Q.

The primary data gap that exists involves the lack of any subsurface soil samples in this area. In addition, all samples collected from the southern portion of Site Q were collected from two distinct depressional areas identified by IEPA as disposal areas. No other portions of the southern part of Site Q have been sampled or characterized. Additional surface soil samples would likely be necessary to complete a baseline HHRA. Also, the analyses performed for the samples collected from Site Q do not include analyses for disposal parameters, nor do they include and analyses to evaluate potential remediation options.

Central/Northern Portion - The nature and extent of contamination is poorly defined in the central portion of Site Q. A total of 7 surface soil/sediment samples have been collected from the central portion of Site Q (this includes two samples, X112 and X113, collected just south of Site R). No subsurface soil samples were collected from the central portion of Site Q. Three surface water samples from ponded water areas and 6 leachate samples have been collected from the central portion of Site Q. The primary data gap that exists involves the lack of any subsurface soil samples at the central portion of Site Q. In addition, the number of samples collected from the central portion of Site Q, given the large area, is minimal.

No surface soil samples have been collected from the northern portion of Site Q (immediately east of Site R). A total of 37 subsurface soil samples were collected from 18 borings and two pits on the northern portion of Site Q. These subsurface soil samples were collected to a maximum depth of 26 feet BGS. The borings in the northern portion of Site Q were placed to provide good lateral coverage of the area and the sample depth intervals provide adequate definition of the vertical distribution of contaminants. The primary data gap that exists for this area, involves the lack of any surface soil data from the northern portion of Site Q. Analysis of surface soils would be necessary to complete a baseline HHRA. Also the analyses performed for the samples collected from Site Q do not include analyses for disposal parameters, nor do they include and analyses to evaluate potential remediation options.

Site R

The nature and extent of contamination is very well defined at the Site R. A clay cap was installed on the landfill in 1979. A total of 21 samples of the clay cap and perimeter samples were collected by Dynamac Corporation in 1989. Approximately 100 subsurface samples have been collected from more than 30 borings at Site R. These subsurface soil samples were collected to a maximum depth of approximately 36 feet BGS. The borings on and around Site R were placed to provide good lateral coverage of the area, and the sample

depth intervals provide good definition of the vertical distribution of contaminants. In addition, numerous leachate and sediment samples have been collected near the Mississippi River to evaluate migration of contaminants. There are no readily apparent data gaps that exist involving Site R.

Area 2 Groundwater

The nature and extent of shallow groundwater contamination beneath the Sauget Area 2 Sites is very well defined in areas immediately adjacent to Sites O and R, including the northern portion of Site Q which lies between the two sites. Hundreds of groundwater samples have been collected from the more than 50 Area 2 permanent or temporary shallow wells. Most of these samples were analyzed for full TCL and TAL parameters or a comparable suite of analyses. The monitoring well locations in Area 2 provide good shallow groundwater coverage of the Area 2 sources with a few exceptions. There are few or no wells to evaluate the following: potential groundwater impacts from Site S; potential groundwater impacts from the southern portion of Site Q; groundwater to the north of Site R; and groundwater between Site R and the central portion of site Q. Also, there are no wells to evaluate potential impacts from Site P.

The nature and extent of intermediate and deep groundwater contamination beneath the Sauget Area 2 Sites is very well defined in areas immediately adjacent to Sites O and R, including the northern portion of Site Q which lies between the two sites. Greater than 100 groundwater samples have also been collected from the more than 25 Area 2 intermediate or deep well locations. Most of these samples were analyzed for full TCL and TAL parameters or a comparable suite of analyses. The intermediate/deep monitoring well locations in Area 2 provide good groundwater coverage of the Area 2 sources with a few exceptions. There are no monitoring wells to evaluate the impacts to intermediate or deep groundwater zones for areas other than in the immediate vicinity of Sites O and R, including the northern portion of Site Q.